PREHealth

Designing health into urban green and blue infrastructures – The need for action in planning, policies, and research

National Report Greece

Erasmus+ PREHealth

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Terms of References

The present report was produced in the framework of the ERASMUS+ project "PREHealth: Promoting education and jobs to enhance the use of urban blue and green infrastructure for health and fitness", and aims at presenting the findings of a literature review on the connection between public health and the use of open spaces in Athens, Greece. The findings presented provide a conceptual framework for recognising the important role of urban green and blue infrastructure in promoting public health, addressing policy and decision makers, educational authorities, local civil society organisations and key persons in the fields of urban design and planning, lifelong learning and public health, as well as the general public.

Project Partners

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Utrecht University
PRISMA – Centre for Development Studies
Széchenyi Istvan University
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Content

Abstract

The present report is set to examine the connection between public health and the use of green infrastructure in Greece, and the capital Athens in particular. Specifically, the focus is placed on the role of the urban green infrastructure as spaces that provide opportunities for physical activities and sports, active recreation and active travel, thus contributing to the improvement of public health. The health profile and the physical activity trends of the Greek population are analysed with respect to the effects of the severe economic crisis in the urban population's quality of life. The report also examines the contemporary policy and practice regarding the management of Athens' green infrastructure towards providing opportunities for physical activity and active recreation to the city's residents. Finally, the report goes on to identify the main issues as well as strengths in the current policy and practice, and makes proposals for the better use of open spaces and their connection to promoting a healthier lifestyle for the city residents.

1. Introduction

The link between good health and physical exercise, an active lifestyle and the release of stress through social interaction and contact with nature, has been strongly established in research literature. The World Health Organisation (WHO) has issued a number of recommendations encouraging people of all ages to lead an active lifestyle, incorporating systematic physical activity into their everyday life, while at the same time avoid behaviour factors that have a direct negative effect in health, like smoking and malnutrition. On the other hand, it is also well established that urban open spaces (green and blue infrastructure) play an important role in improving the living conditions and quality of life in cities by contributing to the regulation of the local environment and micro-climate, inviting social interaction and contact with nature, and offering opportunities for everyday physical exercise, sports, active travel, and stress release. The connection, therefore, between the use of green and blue infrastructure by city dwellers, and the improvement of public health, seems obvious. However, this connection is not always evident in urban policy and practice. This is the case in Greece, and specifically in the capital Athens.

Greece has been plunged in a deep and ongoing economic crisis since 2010, which has already left its marks on the quality of life of large proportions of the Greek population. The historically high unemployment, the steep decrease of incomes together with an increase in taxation, and the bleak prospects for the future, have seriously affected the health profile of the Greek population and have affected the lifestyle choices and health-related behaviours. The physical activity trends in Greece, usually in line with trends in other Mediterranean countries due to similar cultures regarding physical exercise and the common Mediterranean climate, have also been negatively influenced by the crisis. At the same time, the lower incomes in the crisis period have resulted in sections of the Greek population no longer being able to afford the subscriptions in private gyms and health centres. The role of urban green infrastructure therefore, as places offering opportunities for physical exercise, active recreation, active travel, social interaction and contact with nature, needs to be upgraded in urban policy and practice.

The objectives of this report are to examine how the health profile of the Greek population has been affected and whether there are specific socio-economic groups that are in danger, analyse the physical activity trends of the Greek population and identify disadvantaged groups that suffer from lack of necessary physical activity, and look into the current policy and practice in Athens regarding the city's green infrastructure and its connection with public health. The overall aim is to reach a conclusion regarding the need for promoting the better use of public open spaces in order to encourage healthier lifestyles and safeguard public health.

In the following main findings section of the report, the current health profile of the Greek population is presented, along with trends on everyday physical activity and exercise, and the current issues regarding policy and practice in relation to promoting health through the use of Athens' urban green infrastructure. These findings are then analysed in connection to the challenges that the Greek society faces, identifying links and synergies, in order to reach a conclusion and propose a way forward.

2. Approach

The present report is based on literature review and expert interviews.
Literature review includes research papers and surveys regarding the health profile of the Greek population and the impacts of the economic crisis, the dominant trends regarding everyday physical activity as well as engagement to sports and active travel, and policy in place for the management of public open spaces in Athens. It is worth to point out that there is very limited, if any, Greek bibliography regarding the connection between the use of public open spaces (including green and blue infrastructure) and the benefits to public health, probably due to the interdisciplinary character of the theme.

Expert interviews were implemented with the participation of local government officials, in cooperation with the City of Athens (partner in the PREHealth project), regarding the current issues in policy and practice with respect to the management of the city's open spaces (i.e. parks, pedestrian and cycling networks, green spaces etc.), the promotion of health-related behaviours within these spaces, as well as good practices and problems in relation to their function. The local government officials (City of Athens) that participated were representatives of the Directorate for City Planning and the Urban Environment (responsible for planning and designation of open spaces), the Directorate for Road construction, Waste water and Public Spaces (responsible for the design and implementation, as well as maintenance of open space "furniture"), the Directorate for Greenery and Urban Fauna (responsible for the maintenance of vegetation in open spaces), and the Organisation for Culture, Sports and Youth of the City of Athens (responsible for the management of cultural and sports facilities in public open spaces). The interviews took place during May-June 2017 in the newly established Healthy Cities office of the City of Athens, and were based on a predefined set of questions and resulting conversation. The set of interview questions included the following:

- What are your departments' responsibilities regarding open spaces?
- What is your policy and programme regarding the designation and management of open spaces?
- Are there any regeneration plans under way?
- Do you have plans for generating a network of open spaces?
- Does your policy include increasing the green spaces? In what way?
- Do you include in your policy or practice the use of green spaces and/or networks of open spaces for exercise, active leisure or active travel (i.e. walking, cycling)?
- Is there a good practice you can point out in terms of that specific use of open spaces?

3. Main findings
3.1 Health profile in Greece

The health profile of Greek citizens, along with other factors related to the quality of life, has unfortunately suffered the impacts of the severe economic crisis that the country has been experiencing during the last 7 years (from 2010 to today). The research study "The health of Greeks during the Crisis: Mapping the state of health of Greeks and the country's health institutions", published by the Institute of Social and Preventive Medicine in March 2016, presents the research results regarding the crisis' impact on demographics, life expectancy and healthy life expectancy, physical health, mental health, and the quality of life related to health in Greece, as well as behaviour factors that influence health such as smoking, obesity, and physical exercise. The main findings are presented below.

Demographics: There is a decrease in the Greek population after 2010, attributed to a decrease in births and an increase in outward migration. The decrease is persistent year after year, after 2010.

Life expectancy and healthy life expectancy: Greece presents a life expectancy higher than the OECD average, at 81,4 years against 80,4 years of the OECD average. However, during the period 2004-2012 the healthy life expectancy in the age of 65 was reduced by 1 year for men and 2,5 years for women. The average healthy life expectancy in 2012 was similar to the EU average for men, while for women it was lower by 1,2 years.

Physical health: In the year 2012, Greece comes 6th among 24 OECD countries in public hospital entries, with 195 entries per 1.000 citizens, presenting an increase of 21% in the period 2000-2012. This increase can be attributed to 2 factors: the higher percentage of elderly people resulting in increase of the need for medical services, and the greater demand for public health services due to the cost of private medical services during the crisis. In 2013 the greatest increase in incidents was attributed to anxiety disorders, respiratory diseases and depression. According to the results of the Survey on Health carried out by the Greek National Statistical Body (ΕΛΣΤΑΤ) in 2014:
• One in two citizens aged 15+ state that they suffer from a chronic problem or illness. This translates to 4 out of 10 men and 5 out of 10 women, 6 out of 10 being 55 years old or older.
• One in three citizens aged 15+ state that they have limited their activities due to a health problem.

Mental health: Greece is among the European countries with the lower death rate due to mental and behaviour disorders. Greece also presents very low suicide rates among European countries;however, suicides were increased significantly from 377 in 2010 to 533 in 2013 (in the period of the crisis), especially among men. Greece-wide epidemiological studies reveal an increase in clinical depression from 3,3% of the population in 2008, to 6,8% in 2009, 8,2% in 2011 and 12,3% in 2013, strongly related to the economic difficulties the Greek population face. While older studies revealed that elderly and single persons were more prone to depression, latest studies point to younger and married persons as being more likely to suffer. The percentage of the Greek population showing symptoms of depression in 2014 was increased to 16%, and the percentage of population showing anxiety symptoms was increased to 24%, and according to the researchers reveal a great and sustained increase. Men, persons aged 25-44, of a higher educational level, married, and working, are more likely to express anxiety disorders.

Quality of life related to health: According to the World Health Organization charter, health is the state of complete physical, mental and social well-being, not the mere absence of illness or disability. According to that definition, health is a complex biological and psycho-social phenomenon which, beyond the traditional biological dimensions, also includes the concepts of well-being and functionality.

Within this definition, the concept of „Quality of Life Related to Health" has been developed. It is a multidimensional concept that includes indicators of mental, emotional, physical, social and behavioural components of well-being and functionality, considering the way they are perceived by the individual. In Greece, the physical health indicator value as well as the mental health indicator value are significantly decreased in the period 2013-2015 for both men and women. Low self-reported health (SHR) occurs more frequently in elderly people, the unemployed, retired, housewives and people with chronic illnesses; while men, persons with higher education and higher incomes report their health as better. There is an increase in negative self-reported health statements as a result of the financial crisis in Greece.

The main findings related to trends in Greece regarding behaviour factors that have a direct impact on health, are presented here:

Smoking: Although the percentage of smokers in the Greek population has been significantly reduced over the last few years, the percentage of people that start to smoke is still high. Also, in Greece there are still high levels of exposure to passive smoking in the workplaces, public spaces and homes.

Obesity: The percentages of overweight and obese population have increased over the last two decades in Greece as well as in most European countries. According to OECD data, Greece in 2013 presents a percentage of obese population of 19,6% (OECD average is 19%). The highest percentage of overweight population is observed in the 50-64 age group, while the highest percentage of obese population is recorded in the 65-79 age group. The percentage of overweight and obese children in Greece has increased over the last 2 decades, ranking Greece amongst the countries with the highest child obesity percentage in Europe as well as internationally. Child and adolescent obesity are more often related to lower family incomes. Indeed, it is probable that the economic crisis has turned the people to cheaper but calorie-rich foods, leading to higher overweight and obesity percentages in the population. Finally, obesity is strongly linked to an everyday sitting lifestyle (in front of TV, computers, tablets, smartphones), for children and adolescents as well as for adults.

Physical exercise: Women in Greece appear to exercise more than men. Overall, in the period 2009-2011 an increase in physical exercise was reported, but in the period 2012-2013 there is an acute reduction, leading to a negative trend for the whole period 2009-2013. There are great socioeconomic inequalities reported, with lower social and income layers having less exercise. Finally, boys are reported to exercise more than girls, while physical exercise in Greece for children aged 11-15 ranks below that of other OECD countries.

3.2 Physical activity trends in Greece

The findings under the present first part of this unit have been mainly drawn from a research study that was implemented within the largest and most articulated dietary epidemiological research that has been carried out to date in Europe; the EPIC (European Prospective Investigation into Cancer and Nutrition) program or, under its Greek title, the European Program for Cooperation of Medicine and Society (EPIC). Ten European countries are participating in the EPIC program: the UK, France, Germany, Denmark, Greece, Spain, Italy, Norway, the Netherlands, and Sweden. The program is coordinated by the World Health Organization's International Agency for Research on Cancer (IARC) and is funded by the European Union Programme "Europe Against Cancer" and national sources from the participating countries. The research study that took place in Greece (original research paper published in 2005) aimed at assessing the Physical Activity (PA) levels and trends of the Greek EPIC participants (28.030 men and women), regarding their participation in a pre-set list of physical activities during a typical week of the previous year. The Greek participants in the research were 28.030 in total – 11.555 men and 16.475 women, aged 20 years and above, from most geographical areas of Greece and belonging to various socio-economic groups. The assessment findings of this study can be treated as reliable due to its size, its extensive and detailed physical activity questionnaire, as well as the broad representation of the Greek population in terms of age, gender, location of residence, socio-economic status and educational achievement. Unfortunately, there is lack of detailed information on the intensity of each activity, and there is also a possibility of a recall error, which is inevitable in epidemiological studies.

The Table 1 below, demonstrates the age and gender of the research participants in Greece. The majority of participants are older than 35 years old and women outnumber men, 59% to 41%, due to a deliberate choice in the research design to target more women (breast cancer is of special interest to the EPIC).

	Men		Women		Total	
	n (%)		n (%)		n (%)	
Age (years)						
<35	816	(7,1)	1192	(7,2)	2008	(7,2)
35-44	2827	(24,5)	3453	(21,0)	6280	(22,4)
45-54	2725	(23,6)	3841	(23,3)	6566	(23,4)
55-64	2412	(20,9)	4121	(25,0)	6533	(23,3)
65+	2775	(24,0)	3868	(23,5)	6643	(23,7)
Total	11.555	(100,0)	16.475	(100,0)	28.030	(100,0)

Table 1. Greek participants by age and gender.

The Table 2 refers to the involvement of the Greek participants in different physical activities, by age and gender. Walking is the most popular physical activity among participants, and the most common among male participants. In both genders there is an increase in the percentage of participants that walk, the older the participants are. House chores appear as the second most popular physical activity, mainly due to it being the most common PA among women participants. Gardening is stated as the third most popular PA, for both men and women, with women stating that they engage in gardening in a higher percentage than men.

Regarding physical activities that are specifically aimed at improving physical well-being, i.e. aerobics, swimming, running, jogging, tennis etc., the percentages appear significantly lower. The percentage of men engaging in such activities is higher (36,9%) compared to that of women (29,4%), and percentages are higher in younger ages and being reduced with an increase in age. However, women seem to maintain their engagement in such activities in age groups "under 45" and "45-54", contrary to men.

Finally, the less popular physical activities are housework and cycling. In fact, the less widespread physical activity in Greece appears to be cycling to work, for shopping or for leisure, with small percentages for men and women (5,6% and 3,2%) that are also reduced by an increase in age.

	Age	Walking	House Chores	Gardening	PAs for physical well-being*	Housework	Cycling	Intense physical exercise**
	(years)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Men	<45	3300 (90,6)	2283 (62,7)	1307 (35,9)	2065 (56,7)	1231 (33,8)	259 (7,1)	1339 (36,8)
	45-54	2522 (92,6)	1523 (55,9)	1239 (45,5)	1168 (42,9)	852 (31,3)	154 (5,7)	882 (32,4)
	55+	4996 (96,3)	2908 (56,1)	2933 (56,6)	1031 (19,9)	606 (11,7)	231 (4,5)	1103 (21,3)
	Total	10.818 (93,6)	6714 (58,1)	5479 (47,4)	4264 (36,9)	2689 (23,3)	644 (5,6)	3324 (28,8)
Women	<45	4405 (94,8)	4524 (97,4)	2315 (49,8)	2239 (48,2)	411 (8,9)	259 (5,6)	1768 (38,1)
	45-54	3687 (96,0)	3786 (98,6)	2391 (62,3)	1331 (34,7)	319 (8,3)	161 (4,2)	1539 (40,1)
	55+	7697 (96,3)	7839 (98,1)	5444 (68,1)	1276 (16,0)	222 (2,8)	103 (1,3)	2009 (25,2)
	Total	15.789 (95,8)	16.149 (98,0)	10.150 (61,6)	4846 (29,4)	952 (5,8)	523 (3,2)	5316 (32,3)

* Aerobics, swimming, running, tennis etc.
** Activities whose intensity causes sweating or shortness of breath

Table 2. Involvement of 11.555 men and 16.475 women in various physical activities, per age group.

The following Table 3 presents the medians, with the corresponding 25% and 75% values, of engagement in the activities reported in Table 2, in hours per week for men and women, by age group. These values have been calculated on the basis of data received from those involved in the respective activity. For men, the PA with the greatest median engagement per week is walking (6,5 hours). Among men that walk, it seems that those of an older age (>55) walk more than younger men. It is also worth to note that there is a trend of an increase in time dedicated to cycling per week for men, related to the increase of age. The time dedicated to house chores for men presents a decreasing trend from the younger to the older ages. The same trend is evident also for the time dedicated by men to PAs aimed at maintaining their physical well-being. The time dedicated by men to any of the previously mentioned PAs, performed in an intense manner so as to cause sweating or shortness of breath, varies among age groups; there is, however, a clear trend of increase in time dedicated to intense performance of PAs related to the increase of age.

The physical activity with the greatest median engagement per week for women is house chores (28 hours per week), showing a slight decreasing trend with the increase in age. The same decreasing trend with the increase in age of women is evident for PAs aimed at improving the physical well-being, though much less time is dedicated to performing them (1,5 hours per week). The median time dedicated by women to walking, gardening and cycling is 5, 4 and 3 hours per week respectively – for these activities there is an increasing trend with the increase in age. Women, finally, seem to spend less time per week than men performing any the above activities intensively (3 hours per week).

Physical activities	Men (age groups)				Women (age groups)			
	<45	45-54	55+	Total	<45	45-54	55+	Total
Walking								
N	3300	2522	4996	10818	4405	3687	7697	15789
Median value	5,0	5,0	7,0	6,5	5,0	5,0	5,0	5,0
25%-75% values	(3,0—7,5)	(3,0-7,5)	(4,0-10,0)	(3,5-8,5)	(3,0-7,0)	(3,0-7,0)	(3,0-7,0)	(3,0-7,0)
House chores								
N	2283	1523	2908	6714	4524	3786	7839	16149
Median value	6,0	4,0	4,0	5,0	30,0	29,0	28,0	28,0
25%-75% values	(3,0-10,0)	(2,0-8,0)	(2,0-7,0)	(2,0-10,0)	(20,0-38,0)	(21,0-35,0)	(21,0-35,0)	(21,0-35,0)
Gardening								
N	1307	1239	2933	5479	2315	2391	5444	10150
Median value	3,0	3,5	7,0	5,0	3,0	4,0	5,0	4,0
25%-75% values	(2,0—7,0)	(2,0-7,5)	(3,0-14,0)	(2,0-10,0)	(2,0-7,0)	(2,0-7,0)	(3,0-9,5)	(2,0-7,0)
PAs for improving physical well-being								
N	2065	1168	1031	4264	2239	1331	1276	4846
Median value	2,0	1,5	1,0	1,5	2,0	2,0	1,5	1,5
25%-75% values	(1,0-4,0)	(1,0-3,5)	(0,5-2,5)	(1,0-3,5)	(1,0-3,5)	(1,0-3,5)	(0,5-2,5)	(1,0-3,5)
Housework								
N	1231	852	606	2689	411	319	222	952
Median value	2,0	2,0	3,0	2,0	2,0	2,0	2,0	2,0
25%-75% values	(1,0-4,0)	(1,0-5,0)	(2,0-5,0)	(1,0-5,0)	(1,0-2,0)	(1,0-2,0)	(1,0-3,0)	(1,0-3,0)
Cycling								
N	259	154	231	644	259	161	103	523
Median value	2,0	2,0	5,4	3,0	2,0	3,0	3,0	3,0
25%-75% values	(1,0-4,0)	(1,0-4,0)	(2,0-7,0)	(1,5-5,8)	(1,5-4,5)	(1,5-5,0)	(1,5-5,0)	(1,5-5,0)
Intense physical exercise**								
N	1323	873	1093	3289	1740	1525	1993	5258
Median value	3,0	4,0	5,0	4,0	3,0	3,0	3,0	3,0
25%-75% values	(2,0-7,0)	(2,0-10,0)	(2,0-10,0)	(2,0-10,0)	(2,0-5,0)	(2,0-6,0)	(1,0-7,0)	(2,0-7,0)

* Aerobics, swimming, running, tennis etc.
** Activities performed in an intense manner, causing sweating and/or shortness of breath

Table 3. Median values and respective 25%-75% values of time dedicated to various physical activities (hours per week) by age groups of men and women.

In the following Table 4, there is an effort to distinguish the participants' engagement in selected activities (activities aimed at improving physical well-being, gardening, housework and cycling), used as an indicator as to whether participants engage in a systematic physical exercise performed during their free time (apart from walking and house chores). Three out of four participants stated they engage in at least one of the above activities, the percentage being equal for both men and women, and showing a decrease with an increase in age.

	Men		Women		Total	
Age groups	n	(%)	n	(%)	n	(%)
<45	2926	(80,3)	3555	(76,5)	6481	(78,2)
45-54	2088	(76,6)	2991	(77,9)	5079	(77,4)
55+	3619	(69,8)	5931	(74,2)	9550	(72,5)
Total	8633	(74,7)	12.477	(75,7)	21.110	(75,3)

Table 4. Participants' engagement in activities aimed at improving physical well-being, gardening, housework and cycling, by gender and age groups.

The results of the Eurobarometer survey "Special Eurobarometer 412: Sport and physical activity" that was published in 2015 generally confirm the findings above and also provide further insight by focusing more on sports and presenting the responses of 1.007 Greeks in comparison to other nationalities and the EU average. The data in the tables presented below were collected in 2013 and the survey participants are evenly spread across different ages, genders and socio-economic characteristics; the presentation of the findings also for Germany, Hungary and the Netherlands is deliberate and connected to the PREHealth project partner countries.

The Table 5 below demonstrates the engagement frequency of the survey participants in sports and sport related activities, per country. It is important to stress the very high percentage of Greeks (59%) that have stated they never exercise or play a sport. The German and Dutch participants seem to engage in a sport activity a few times a week at a rate well above the EU average, while the Hungarian participants seem to follow the EU average.

	EU28	DE	EL	HU	NL
TOTAL	27919	1600	1007	1012	1037
Almost daily	2312 *8%*	117 *7%*	68 *7%*	158 *15%*	82 *8%*
A few times a week	9086 *33%*	656 *41%*	240 *24%*	230 *23%*	520 *50%*
Occasionally	4706 *17%*	365 *23%*	100 *10%*	179 *18%*	134 *13%*
Never	11705 *42%*	457 *29%*	598 *59%*	443 *44%*	300 *29%*
DK	110 -	5 -	0 -	2 -	0 -

Table 5. By „exercise" we mean any form of physical activity which you do in a sport context or sport-related setting, such as swimming, training in a fitness centre or a sports club, running in the park etc. How often do you exercise or play sport? Source: Special Eurobarometer 412: Sport and physical activity, own editing.

The Table 6 below presents the participants' engagement frequency in other physical activities for recreational or non-sport-related reasons. Again the very high percentage of Greek participants who never engage in such activities must be noted. On the opposite side of the spectrum, the vast majority of the Dutch participants state they engage in such activities almost daily or a few times a week.

	EU28	DE	EL	HU	NL
TOTAL	27919	1600	1007	1012	1037
Almost daily	4111 *15%*	286 *18%*	76 *8%*	214 *21%*	450 *44%*
A few times a week	9200 *33%*	715 *45%*	255 *25%*	301 *30%*	404 *39%*
Occasionally	6094 *22%*	369 *23%*	185 *18%*	212 *21%*	117 *11%*
Never	8376 *30%*	226 *14%*	492 *49%*	284 *28%*	65 *6%*
DK	137 -	5 -	0 -	0 -	0 -

Table 6. How often do you engage in other physical activity such as cycling from one place to another, dancing, gardening, etc.? By „other physical activity" we mean physical activity for recreational or non-sport-related reasons. Source: Special Eurobarometer 412: Sport and physical activity, own editing.

Out of the participants that stated they engage in some form of sport or physical activity, the Table 7 offers an insight as to the location where they engage. It is worth to note that Greek participants state they engage in a PA mainly on the way between home and school, work or shops, and secondly in a park or outdoors, and at home. Also, Greek participants state they use the facilities of a health or fitness centre at a percentage higher than the EU average and the other 3 participating countries.

	EU28	DE	EL	HU	NL
TOTAL	20912	1412	610	764	992
At a health or fitness centre	3151 *15%*	230 *16%*	125 *20%*	49 *6%*	178 *18%*
At a sports club	2665 *13%*	302 *21%*	48 *8%*	41 *5%*	233 *23%*
At a sports centre	1692 *8%*	76 *5%*	33 *5%*	25 *3%*	103 *10%*
At school or university	954 *5%*	58 *4%*	19 *3%*	40 *5%*	56 *6%*
At work	2665 *13%*	215 *15%*	64 *10%*	102 *13%*	124 *13%*
At home	7464 *36%*	650 *46%*	191 *31%*	388 *51%*	349 *35%*
On the way between home and school, work or shops	5305 *25%*	378 *27%*	248 *41%*	218 *29%*	288 *29%*
In a park, outdoors, etc.	8352 *40%*	597 *42%*	204 *33%*	125 *16%*	369 *37%*
Elsewhere (SPONTANEOUS)	856 *4%*	24 *2%*	23 *4%*	21 *3%*	50 *5%*
DK	750 *4%*	33 *2%*	2 *0%*	35 *5%*	15 *2%*

Table 7. Where do you engage in sport or physical activity?, Source: Special Eurobarometer 412: Sport and physical activity, own editing.

The Table 8 offers an insight as to the reason of the participants' engagement in sports or other PAs. The improvement of their health is strongly connected to the engagement in sports and other PAs, as it is the most popular reason given in all countries. The Greek participants state they engage mainly in order to improve their health and their fitness, as well as relax, while the German and Dutch participants also add "having fun" as a main reason for doing sports and other PAs.

	EU28	DE	EL	HU	NL
TOTAL	20912	1412	610	764	992
To improve your health	12974 *62%*	998 *71%*	342 *56%*	301 *39%*	604 *61%*
To improve your physical appearance	4786 *23%*	332 *23%*	128 *21%*	186 *24%*	142 *14%*
To counteract the effects of ageing	3245 *16%*	313 *22%*	41 *7%*	89 *12%*	141 *14%*
To have fun	6286 *30%*	569 *40%*	144 *24%*	66 *9%*	555 *56%*
To relax	7572 *36%*	550 *39%*	245 *40%*	194 *25%*	556 *56%*
To be with friends	4109 *20%*	323 *23%*	102 *17%*	86 *11%*	210 *21%*
To make new acquaintances	1041 *5%*	64 *5%*	15 *2%*	18 *2%*	88 *9%*
To meet people from other cultures	520 *2%*	41 *3%*	5 *1%*	10 *1%*	10 *1%*
To improve physical performance	5074 *24%*	542 *38%*	94 *15%*	210 *27%*	214 *22%*
To improve fitness	8414 *40%*	603 *43%*	299 *49%*	235 *31%*	537 *54%*
To control your weight	5089 *24%*	384 *27%*	118 *19%*	61 *8%*	374 *38%*
To improve your self-esteem	2194 *10%*	214 *15%*	41 *7%*	60 *8%*	74 *7%*
To develop new skills	1314 *6%*	104 *7%*	22 *4%*	20 *3%*	67 *7%*
For the spirit of competition	1142 *5%*	74 *5%*	21 *3%*	23 *3%*	80 *8%*
To better integrate into society	647 *3%*	57 *4%*	16 *3%*	9 *1%*	19 *2%*
Other (SPONTANEOUS)	1752 *8%*	77 *5%*	43 *7%*	109 *14%*	105 *11%*
DK	778 *4%*	45 *3%*	3 *0%*	40 *5%*	8 *1%*

Table 8. Why do you engage in sport or physical activity?
Source: Special Eurobarometer 412: Sport and physical activity, own editing.

Table 9 below presents the participants' responses about the main reasons preventing them to practice sports more regularly. The main reason seems to be the lack of available time to dedicate to doing sports, followed by the lack of motivation or interest. It is worth to note that the percentage of participants that spontaneously replied they are already doing sports regularly is higher than the EU average for German and Dutch participants, and lower for the Greek and Hungarian participants.

	EU28	DE	EL	HU	NL
TOTAL	27919	1600	1007	1012	1037
You do not have the time	11696 *42%*	604 *38%*	463 *46%*	433 *43%*	302 *29%*
It is too expensive	2869 *10%*	117 *7%*	122 *12%*	127 *13%*	88 *8%*
You do not like competitive activities	1772 *6%*	93 *6%*	48 *5%*	104 *10%*	50 *5%*
There is no suitable or accessible sport infrastructure close to where you live	1110 *4%*	49 *3%*	62 *6%*	59 *6%*	12 *1%*
You have a disability or illness	3613 *13%*	205 *13%*	86 *9%*	175 *17%*	139 *13%*
You do not have friends to do sports with	982 *4%*	68 *4%*	50 *5%*	53 *5%*	13 *1%*
You feel discriminated against by other participants	160 *1%*	7 *0%*	4 *0%*	15 *1%*	1 *0%*
You lack motivation or are not interested	5705 *20%*	361 *23%*	269 *27%*	185 *18%*	153 *15%*
You are afraid of the risk of injuries	1362 *5%*	59 *4%*	38 *4%*	67 *7%*	46 *4%*
You are already doing sports regularly (SPONTANEOUS)	3932 *14%*	373 *23%*	127 *13%*	81 *8%*	342 *33%*
Other (SPONTANEOUS)	1811 *6%*	66 *4%*	42 *4%*	68 *7%*	92 *9%*
DK	935 *3%*	49 *3%*	15 *1%*	35 *3%*	11 *1%*

Table 9. What are the main reasons currently preventing you from practicing sport more regularly?
Source: Special Eurobarometer 412: Sport and physical activity, own editing.

The Table 10 below presents the participants' responses regarding the frequency of walking for at least 10 minutes in their everyday life. The walking habits of the Greek participants seem to follow the EU average; furthermore on average the Greek participants appear to come second in walking between the 4 participating countries.

	EU28	DE	EL	HU	NL
TOTAL	27919	1600	1007	1012	1037
Never	3699 *13%*	103 *6%*	129 *13%*	180 *18%*	145 *14%*
1-3 days	7087 *26%*	364 *23%*	253 *25%*	325 *32%*	279 *27%*
4-7 days	16853 *60%*	1120 *70%*	624 *62%*	503 *50%*	607 *59%*
DK	280 *1%*	13 *1%*	2 -	4 -	5 -
Average	4,4	4,9	4,4	3,7	4,2

Table 10. In the last 7 days, on how many days did you walk for at least 10 minutes at a time?
Source: Special Eurobarometer 412: Sport and physical activity, own editing.

Finally, the Table 11 presents the participants' responses regarding the time spent sitting on a usual day (at a desk, visiting friends, studying or watching TV). The Greek participants seem to spend more time sitting on a usual day compared to the EU average. It is also worth noting that among the 4 participating countries in PREHEalth, the Hungarian participants state they spend the less time sitting, and the Dutch participants appear to spend the most time sitting.

	EU28	DE	EL	HU	NL
TOTAL	27919	1600	1007	1012	1037
2h30min or less	4921 *17%*	282 *18%*	153 *15%*	252 *25%*	57 *5%*
2h31min to 5h30min	11909 *43%*	663 *42%*	433 *43%*	470 *47%*	330 *32%*
5h31min to 8h30min	7185 *26%*	454 *28%*	296 *30%*	196 *19%*	379 *37%*
8h31min or more	3034 *11%*	166 *10%*	122 *12%*	73 *7%*	263 *25%*
DK	870 *3%*	35 *2%*	2 -	21 *2%*	9 *1%*

Table 11. How much time do you spend sitting on a usual day? This may include time spent at a desk, visiting friends, studying or watching television.
Source: Special Eurobarometer 412: Sport and physical activity, own editing.

3.3 Policy and Practice: Green infrastructure and open spaces in Athens

Introduction

Green infrastructure is defined as the strategic design of a network that incorporates natural or artificial green spaces and areas or elements of the city with environmental characteristics. This results in a continuous grid of green corridors connecting the urban area with the surrounding natural landscapes and at the same time penetrating the urban fabric, ensuring environmental benefits for the inhabitants, helping to adapt to climate change and facilitating the conservation and development of natural ecosystems.

Green spaces are an indispensable component of cities, but also one of the most important factors for ensuring an improved quality of life for their residents. That is why planning green spaces in cities is an integral part of, but also a necessary condition for, the implementation of sustainable and integrated urban and environmental planning. A principle, which becomes even more imperative in the case of great cities, where the „vastness" of the built area dramatically enlarges the distances and hinders the accessibility and contact of the inhabitants with the countryside and nature.

In the case of Athens the urban expansion and population increase, magnified the city's needs for green spaces and added a metropolitan character to the design of its green infrastructure. Despite the fact that securing the necessary green spaces - local and / or metropolitan - has been part of Athens' planning policy for decades, only a small part of it has actually been implemented. At the same time, important decisions for implementing the city's green infrastructure are still pending.

Historical context

The design of green spaces in Greece began in the 19th century. Initially, only the urban centers for which urban and street planning projects were created were fortunate enough to acquire parks and gardens - according to European standards (Gladzhi and Ramphou, 2012).

Until the first post-war years, the value and role given to green spaces was mainly aesthetic. The relatively small size of the urban settlements and their dispersal in the Greek countryside degraded the environmental role and usefulness of urban green spaces. However, the intense inflow of rural population to urban centres and the consequent violent urbanization, which led to the intensive building of the free spaces of the city and its expansion to the peri-urban areas imposed a change in the perceptions regarding urban planning and the design of urban green spaces.

In particular, the establishment of organized urban green areas in Athens begins with the establishment of the Greek state (1831) and the proclamation of Athens as the capital city. It is at the time of king Otto (1831-1863) that the city's architectural design by the architects of the time (Kleanthis, Schaumbert, Klenze, Gaertner etc) resulted in the creation of parks and gardens in Athens. During this period (1839) the royal garden of 15.5 hectares located in the centre of Athens, known today as the National Garden, was created. Later, and until the beginning of the 20th century (1863-1914) the urbanization of Athens took place in parallel to the tree planting of the central hills Lycabettus, Philopappou, etc. At the same time, many gardens were created next to important buildings, with the buildings' architects themselves being responsible for the garden designs (Gladzhi and Ramphou, 2012).

In the aftermath of the Asia Minor Catastrophe, characterized by the massive influx of refugees in Athens, the great and urgent need for housing, together with a semi-legal exploitation of unbuilt land, resulted in the urbanisation of important green spaces of the capital (such as the Skouze Hill). On the other hand, in 1934, the park "Pedion touAreos", which was already a place of recreation for the Athenians since king Otto's time, was designed; the afforestation and restoration works in the period 1935-1940 created a green space in the center of Athens, which together with the Phoinopoulos hill now covers an area of 27,7 hectares.

The urban parks and gardens created until the beginning of the 20th century, combined with the archaeological zone and the green hills of central Athens (Ardittos, Philopappou, Strefi, Lycabettus) constitute the historic green zone, which is of metropolitan importance. The groves and parks created in the new districts developed before WWII as the result of the refugees influx from Asia Minor (N. Smyrna, Nea Philadelphia, Pangrati etc.) are characterized as of inter-municipal or supra-local importance.

Similarly, district groves are also created after the war, using former industrial or military sites, such as Haidari, Egaleo, Peristeri, Piraeus etc. However, it is the last period of the 20th century when a particular focus is placed on the environmental dimension of urban planning in Athens. The introduction of the Athens Master Plan in 1985 by the "Organisation for the Master Plan and Environmental Protection of Athens" (the body responsible for implementing the Athens Master Plan), recommended the increase of free spaces by five (5) square metres per inhabitant. At the same time, in 1994, the Ministry for the Environment, Physical Planning and Public Works promoted the „Attica SOS" Program, which proposed major interventions for the creation of metropolitan green spaces, such as the regeneration of Eleonas, former Hellinikon Airport, Goudi Park, the Environmental Sensitization Park „AntonisTritsis" and the Selepiciari Park in Nicaea. The last three are the only metropolitan parks to date, due to the partial implementation of the proposed interventions.

Today, according to the Greek legislation and the Greek planning standards in force since 2004, the green spaces standard per inhabitant in urban areas is 8 square meters, while special guidelines are proposed for planning and interconnecting the green spaces with other functional city elements. This standard of 8 sq. m. per inhabitant, although much smaller than the international standards and practices, is in Athens (as well as in many other Greek cities) still lagging considerably in practice. The problem is mainly focused on the densely built urban areas, where past practices have often created irreversible situations regarding available land.

Green spaces in Athens

The green spaces of Athens are divided into two types according to their location:

• The urban green spaces: green spaces located within the Athens urban complex; and

• The peri-urban green spaces: green spaces located around and in direct contact with the Athens urban complex.

In addition, the green spaces of Athens are divided into two categories according to their range, i.e. the area they serve, and their size:

• Metropolitan or inter-municipal spaces: This category includes almost all of the peri-urban green areas, because due to their size, capacity and location they are addressed to a large proportion of the Athenians. Similarly, this category may also include green spaces located within the urban complex.

• Local green spaces: They aim at serving the needs of residents at the lowest level of the neighborhood or district, usually not related to pre-existing physical formations or historically formed areas, and are often small spaces created by the application of urban planning standards in the context of the implementation of local plans (Municipality Plans).
Regarding the peri-urban green spaces, Athens is characterized by the presence of the four mountainous areas surrounding the urban complex, constituting natural walls against the urban sprawl. These mountainous areas, from the west to the east, are: Mount Egaleo, Mount Parnitha, Mount Penteli and Mount Ymittos. The importance of protecting these mountenous areas was recognized in Greek law and policy relatively early. In 1961, Parnitha was declared a National Park, and in 1969 all four mountainous ranges were declared Landscapes of Special Natural Beauty. The establishment of areas of special protection followed. Similarly, within the protected area of Mount Ymittos and within the City of Athens, the „Goudi" and „Ilissia" parks have been created.
Regarding the metropolitan or inter-municipal urban green spaces, they present a great variety and are well spread within the Athens urban complex. They consist of:
• Gardens or parks, created for aesthetic purposes at various historical phases of the capital (from the 19th to the 20th century), or more recently with a view to increasing green space and enriching biodiversity within the urban fabric,
• Natural formations, such as the streams (Kifissos river etc.) and the hills (e.g. Lycabettus etc.)
• Restored quarries and / or industrial areas, such as Elaionas.

According to the Greek planning standards for green spaces (8 sq. m. per inhabitant), the Athenian basin should include a total area of green spaces exceeding 3.500 hectares (NTUA, 2011). However, today they are only about 2-2.5 sq.m. of green space per inhabitant, while the existing open spaces correspond to only 3, 84 sq.m. per inhabitant (Belabilis et al., 2012).
The proportion of available urban green space to the population of Athens is particularly low compared to other European cities, as well as the targets of the 1985 Athens Master Plan and the Greek planning standards. This is due to the fact that the network of green spaces planned after 1985 was only partly implemented, while the possibility of implementation was further limited by the construction of the Olympic infrastructure that took place in the period 2000-2004. Building the Olympic infrastructure exhausted large reserves of available land which was proposed by planning policy to become green spaces, committing it to other permanent uses (the development of this land as green space would have added an extra 1,23 sq. m. per inhabitant). Moreover, the distribution of urban green spaces is uneven, particularly between the areas of the historic center and the northern and northeast districts, and those of the southern and western districts (Belavillas and Batavalis 2009).

The Athens Master Plan was revised recently (2014). However, given the harsh economic circumstances of the recent years, any actions were very limited, focusing mainly on policy revisions and / or modifications of already established green spaces. Today, following the abolition of the Organization for the Master Plan and Environmental Protection of Athens in 2014, the development of spatial planning policy for the Athens urban complex is the responsibility of the Ministry for the Environment and in particular the Directorate for the Design of Metropolitan Urban and Peripheral Areas.

Athens presents a considerable variety of green spaces (natural ecosystems, parks, green spaces of metropolitan and local character, etc.). However, both the proportion of green spaces per

inhabitant and their geographical distribution in the urban fabric are not in line with the provisions and standards set by the Greek planning legislation, and in fact fall short in comparison to other European cities. Especially in the central areas of the City of Athens, the proportion of green spaces per inhabitant is well below the standard proportion (8m2 / inhabitant).

It is also characteristic that peri-urban green spaces play an important role by offsetting the deficiencies observed in green spaces as a whole within the city. The same applies to the case of historical and archaeological sites and monuments, which are often accompanied by remarkable green areas.
Particular emphasis and attention has been given to the peri-urban green areas but also to the extensive green spaces within the urban complex. That is why both peri-urban green areas and metropolitan parks are often the subject of protection under environmental legislation and, therefore, the subject of greater care by the competent bodies.

While, however, metropolitan green spaces (peri-urban and within the Athens urban complex) seem to be enjoying the systematic interest and attention of the state and the competent agencies, the same is not true regarding the local green spaces that have been typically created from the application of urban planning standards in the implementation framework of local municipality plans. In particular, despite the fact that in recent years the local municipality plans that have been implemented within the Athens urban complex are sufficient and with satisfactory proposals regarding green spaces, in practice very few of them are implemented, thus failing to improve the quality of life in the city.

Therefore, it is of great importance that, in addition to the metropolitan green spaces that often monopolize interest and discussion, equivalent and more substantial care is provided for local green spaces as well. Due to their dispersal in the Athens urban complex, the local green spaces can take on a substantial role in the life of the Athenians, covering essential needs at the lowest level of the neighbourhood or the district.

In 2015 the Integrated Urban Intervention Plan for the Athens city centre was approved by law. The Plan covers part of the city centre (indicated with a green line in the map below) and includes a great

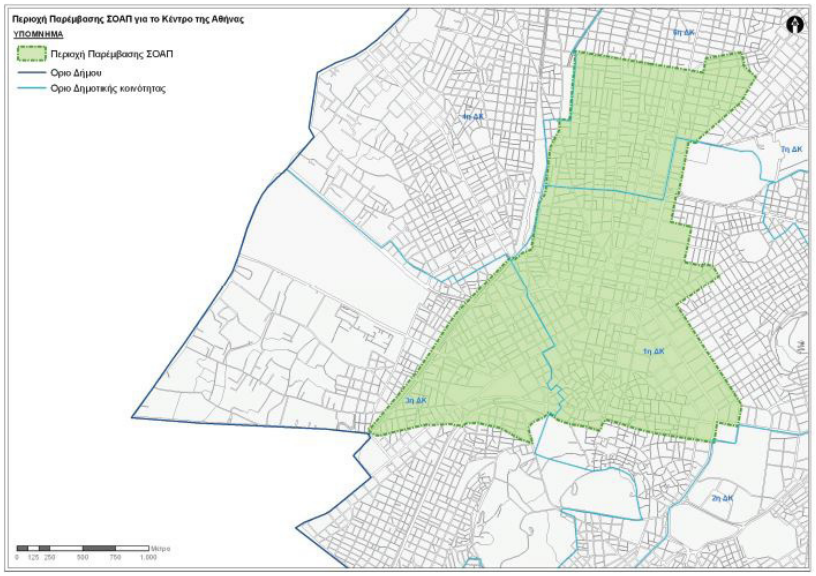

Figure 1: Integrated Urban Intervention Plan for part of the Athens city centre (intervention area indicated by green line within the Municipality of Athens).

number of interventions including the revitalization of public open spaces and restoring their accessibility, regeneration of selected public open spaces and pedestrian networks, etc. The planned interventions are currently in the process of securing finance. The designation of public open spaces in the rest of the municipality area goes ahead through local plans that are in process.

Management of open spaces in the City of Athens

The process of designating a public open space in the city of Athens lies within the responsibilities of the Directorate for City Planning and the Urban Environment (City of Athens), which is recommending certain open spaces to be designated by law by the Regional or the Decentralised Authority. Today the Directorate places its focus more on preserving the already designated public open spaces, than recommending new designations.

Design and implementation of the designated public open spaces falls under the responsibilities of the Directorate for Road Construction, Waste water and Public Spaces (City of Athens), and its Design Department. The focus is placed on:

• Bioclimatic design of the public open spaces, aiming to improve the local microclimate, e.g. providing for shade during the summer and allowing sunlight in the winter months.

• Preventing and discouraging delinquent behavior within the public open spaces through their open design. The design of open spaces in the city has changed nowadays in comparison to the past practices. In the past, the design focused on including a variety of uses in order to cater for different user needs (i.e. children playgrounds, sports facilities, resting places, etc.), each covering a smaller designated space. Nowadays the design of open spaces in the city has oriented towards an open design in order to discourage delinquent behavior and criminal activity. The city public open spaces users have changed in many neighbourhoods of the city centre; immigrants and refugees with different behaviors and use patterns regarding open spaces have in many cases driven local users out. This phenomenon poses a serious issue for the design of open spaces, due to the lack of relative research and scientific data on the new user-behaviours and ways to cater for and reconcile different and conflicting open space uses.

• Creating "Green corridors" in the city of Athens, i.e. green pedestrian/cycling ways that connect open spaces and/or open spaces with public transport stations and hubs, in order to encourage green/active travel (walking, cycling), also combined with public transport modes.

• Increasing the vegetation in public open spaces where possible by 10%, safeguarding their green character.

The Directorate for Greenery and Urban Fauna is responsible for the maintenance of vegetation in public open spaces (pruning, grooming etc.), as well as the selection of the plant species to be planted, and cooperating with the Directorate for Road Construction, Waste water and Public Spaces for the design of public open spaces. A positive factor for encouraging the creation of green corridors, is the fact that in Athens the practice of planting tree rows on both sides of the street has been very widespread (in fact Athens is considered as the European city with the greatest length of tree rows).

An important issue regarding the local open spaces within the City of Athens is that, although they are designated public open spaces, only a few are fully under the ownership of the municipality through the process of compulsory purchase. Most are in the compulsory purchase process; however, a recent law has made lifting the compulsory purchase possible if the resulting

compensation has not been paid in full to the land owner. Compulsory purchase procedures usually take many years to complete (if at all) due to the poor financial resources of municipalities, made even scarcer in the current environment of economic recession in Greece, and due to complex and time-consuming processes foreseen by law (e.g. locating the land owners).

Also, illegal occupation of public open space by commercial uses is unfortunately a common practice in Athens and Greece in general. The phenomenon is often not limited to the occupation of the public open space by tables and chairs of restaurants/tavernas/cafes/bars, but goes further to expanding the private commercial uses against the public space by building light constructions.

Another problem is the destruction and vandalism of infrastructure in public open spaces, in some cases with the purpose of stealing materials like metallic elements (copper, iron) in order to sell it as raw material.

A longstanding, serious and structural problem is connected to the management of public open spaces. The management of public open spaces in Athens is the responsibility of different government tiers, i.e. the City of Athens (Municipality), the Regional Authority and in some cases the central government. Also, it is shared between different directorates of the same local authority. In the City of Athens, for example, the municipal Directorates responsible for different aspects of the management of public open spaces, are:
a. Directorate for City Planning and the Urban Environment (responsible for planning and designation).
b. Directorate for Road construction, Waste water and Public Spaces (responsible for the design and implementation, as well as maintenance of open space "furniture").
c. Directorate for Greenery and Urban Fauna (responsible for the maintenance of vegetation).
d. Directorate of Cleanliness, Recycling and Mechanical Equipment Maintenance (responsible for cleaning).
e. Directorate of Building Works (responsible for construction works in the open space).
f. Directorate of Municipal Revenues (responsible for managing commercial uses in public open spaces).
g. Organisation for Culture, Sports and Youth of the City of Athens (responsible for the management of cultural and sports facilities in public open spaces).

This complex structure of different bodies responsible for different aspects of management of open spaces has obviously resulted in lack of coordination, often the actions of one directorate conflicting with the actions of another directorate in the same municipality. An example is the Directorate of Municipal Revenue offering permits for commercial use in public open spaces, which are in conflict with the design of the space generated by the Directorate for Road construction, Waste water and Public Spaces.

In an effort to tackle this longstanding management shortcoming, the Healthy Cities office of the City of Athens was established only recently (within 2017). This newly formed body aims at:
• Monitoring and coordinating the inter-sectoral cooperation between the municipal services in the sectors of health, welfare, culture, environment, sustainable urban development and quality of life in the city, according to the principles of the European Healthy Cities Network of the World Health Organization.
• Proposing and implementing programs and actions of health promotion and education, both physical and mental, aiming at the creation of a natural and built environment that encourages and supports health, recreation, well-being, security, social action, accessibility, mobility ability and a sense of cultural identity.

• Creating a network of partners from Universities, NGOs, Volunteer Organizations, Stakeholders and Companies aiming at the elaboration and implementation of the programs mentioned above.
• Organizing workshops – conferences in order to inform and raise public awareness about health, environmental and culture issues, and preparing the participation of the Municipality in information, know-how and good practices exchange networks with other cities, in Greece and abroad.
• Documenting and evaluating all data constituting the environmental image of Athens in cooperation with the Department of Topography and Environment of the Directorate of City Planning and Urban Environment.
• Representing the City of Athens in the National Multi-municipal Healthy Cities Network.

City of Athens policy and practice related to sports

As stated above, the municipality organization responsible for implementing the policy related to sports in the City of Athens, is the Organisation for Culture, Sports and Youth of the City of Athens (OPANDA). It is responsible for organizing various sports events in the City of Athens, in some cases in cooperation with other organisations in the fields of sports and education, and for managing the cultural and sports facilities owned by the City of Athens. The sports facilities managed by OPANDA are:
• Open air facilities:
    - 79 basketball courts
    - 15 volleyball courts
    - 9 mini football fields (5x5)
    - 5 tennis courts
    - 3 football fields (11x11)
    - 3 handball courts
• 5 housed basketball/volleyball/handball courts
• 3 housed swimming pools.

While in the past the OPANDA policy was focused on making the above sports infrastructure available mainly to established sports clubs and associations, active in the City of Athens, there is nowadays a turn towards providing opportunities for sports in the neighbourhood level, directly to the residents, in an effort to include as many residents as possible. In this framework, neighbourhood activities are to be established soon, and various sports events are currently being organized:
• Fitness and well-being activities organized at various green spaces of Athens, such as the National Garden and the Goudi Park: Fitness, yoga, pilates etc. classes for adults and families are organized.
• Running and cycling races in the city of Athens: Throughout the year, OPANDA organizes running or cycling races, through streets of Athens. During the races the streets within the racing routes are closed to car traffic. The Cycling Tour of Athens is an event organized yearly.
• Sports tournaments organized in various sports facilities (open air or housed) managed by OPANDA: Basketball, volleyball and football tournaments are being organized all year-round. School championships are also organized every year.

It is worth to mention that it is a common practice that the above municipal sports facilities are integrated within local parks or greater supra-local green spaces in the city of Athens. However, it is also necessary to stress that there is no overall management of these green spaces by one

managing department, but different directorates or bodies of the City of Athens – as presented above. There is also a profound deficit of information reaching the city residents on the opportunities available for physical activity and active recreation in the city, the available infrastructure and ways to combine different activities in order to maximize the benefits to public health.

Active mobility in Athens: walking and cycling network

Athens is, unfortunately, a car-dominated city. The contemporary policy framework in Greece regarding the design and upgrade of the urban transport network is limited to setting standards for pavements design and standards related to the network's functionality with regard to car use.

In the past there have been studies and proposals for the introduction of cycling networks in Athens. The most important was published by the National Technical University of Athens (Sustainable Mobility Unit) in 2011, entitled "Athens Metropolitan Cycling Network". The study makes an ambitious proposal for introducing a 226 km cycling network, that would dynamically change the transport model of Athens towards a model based on sustainable mobility and active transport. The proposed cycling network presented below connects residential areas with green spaces and sport centres, central and local administration centres (ministries, local authority), hospitals, schools, shopping centres, and is well integrated to public transport networks and pedestrianized areas of Athens. The part of the network proposed to be implemented in a first phase is presented in green, and the part to be implemented in a second phase is presented in blue. Existing pedestrian ways and cycling routes to be integrated to the Metropolitan Network are presented in magenta, and parts of the network proposed to be included in local regeneration projects are presented in yellow.

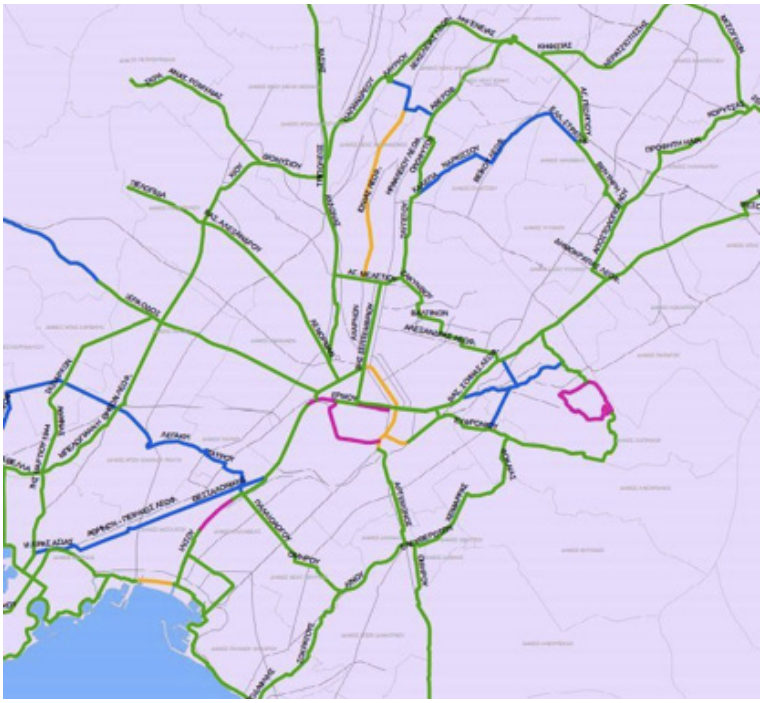

Figure 2: Athens Metropolitan Cycling Network. Source: "Athens Metropolitan Cycling Network", NTUA, 2011.

However, until today only a very small part of this ambitious project has been implemented. On the maps below, the existing cycling routes of Athens are presented in green. Pedestrianized areas in central Athens are presented in yellow, and bicycle sharing spots are presented in red points.

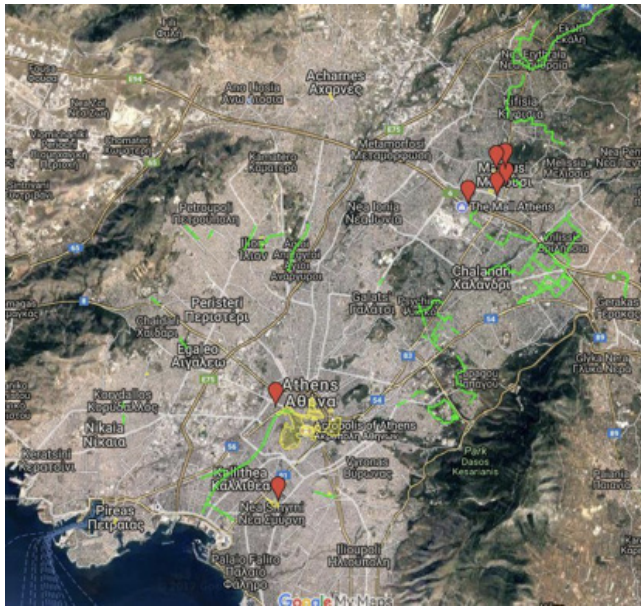

Figure 3: Existing cycling networks in the greater Athens area.

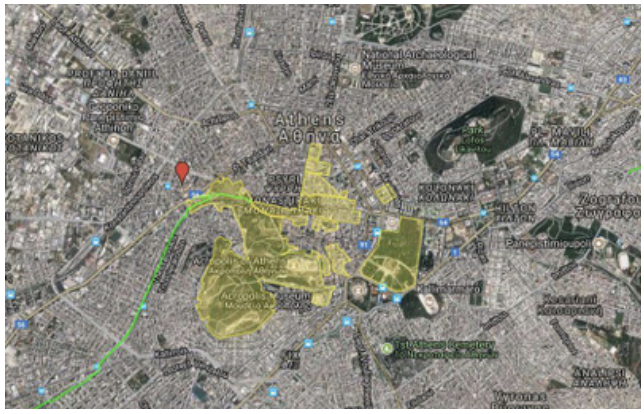

Figure 4: Existing cycling network and pedestrianized area in the City of Athens.

One of the latest research papers on the subject, enitled "A methodology for the pilot design of green corridors on the basis of urban planning and transport planning criteria: Case studies for green corridors in Attica" (Bakogiannis et.al., 2014), proposes the introduction of a methodology for the design and implementation of "green corridors" in Athens. It is a first step for the creation of an integrated project for the unification and connection of green spaces and linear green links in Athens, aiming at improving the city's environmental and transport trends away from the domination of car use and towards a new transport model that introduces walking and cycling with safety in a green setting. The paper presents case-studies for proposed and existing green corridors, on the basis of the Athens Metropolitan Cycling Network proposals, as well as in other parts of Athens connected to existing green spaces.

Discussion

Based on the main findings presented in the previous chapter, and in relation to the challenges identified in the introductory chapter of the present report, there are three broader issues that are interlinked and influence the current situation in Greece, and Athens in particular, in terms of using open spaces to promote public health. These issues and their combined impact inevitably influence any future policy and practice proposals on the theme of promoting health through a more effective use of urban green infrastructure in Athens. The broader issues identified and further analysed below, are:

Deterioration of the health profile of the Greek population during the crisis period: Physical health, mental health, lifestyle factors with a direct impact on health, and the role of the economic crisis.

The deep economic crisis in Greece since 2010 has affected the Greek demographics as well as the health profile of the Greek population in many ways. The decrease in births combined with the acute increase in outward migration of population in productive age-groups has further increased the proportion of older and retired people in the Greek population. Physical as well as mental health indicators' values have decreased. The increase in mental health incidents (anxiety disorders, depression) combined with the change in the socio-economic profile of persons suffering, from the elderly and single persons to the younger and married, also indicates that the economic crisis has made younger, married and employed persons more vulnerable to depression and anxiety disorders, probably due to their increased burden in terms of providing for their spouses and families. Furthermore, negative lifestyle factors directly linked to health such as smoking, malnutrition and lack of physical exercise seem to be on the rise. Especially regarding the obesity phenomenon, there seems to be a link with the lower incomes resulting from the crisis and the turn of a proportion of the Greek population to cheaper but calorie-rich food. Also, the acute reduction in physical exercise, together with the steep socio-economic inequalities reported (lower social and income layers suffer more from lack of physical exercise), can also be attributed in part to the crisis. As indicated clearly from the findings above, the economic crisis in Greece over the past 7 years has taken its toll on the health profile of the Greek population, revealing a worrying trend and affecting a wider range of socio-economic groups than in other European countries.

Physical activity and sports trends of the Greek population: Dominant mentality and culture related to sports and physical activity, population groups in danger because of lack of PA.

The physical activity and sports trends of the Greek population reveal a lag in relation to the EU average and especially countries of central and north Europe. Walking and house chores are the most popular forms of everyday physical activity among the Greek population, the second being most popular amongst women and contributing the most to their daily energy consumption; a common trend among Mediterranean populations connected to cultural norms. However, although walking and house chores are indicative as to how active is someone in his/her everyday life, in fact they do not relate to a conscious effort for promoting someone's health through physical exercise; both activities are related mainly to satisfying needs of the everyday life, like walking to go shopping and cleaning the house. The participation of the Greek population in activities usually selected also for promoting personal health besides personal enjoyment, like running, exercising a sport, gardening or cycling, is rather low in relation to other European countries, and has rapidly deteriorated during the last decade. The findings of the research study published in 2005 (presented in the previous chapter) indicate that 25% of the survey participants did not put an effort in any form of physical exercise besides the everyday activity needed; the findings of the Eurobarometer survey, published 10 years later (2015), reveal that this percentage has reached 40%. Taking also into account that this percentage is higher in older ages as persons tend to abandon any conscious effort to keep fit and stick to the minimum physical activity needed in their

everyday lives, a worrying trend is revealed for public health in Greece, as the lack of physical exercise and a "sitting" lifestyle are recognized by WHO to be factors directly linked to health problems.
The findings related to the level of physical activity in the everyday lifestyle of the Greek population indicate that, although Greeks are relatively active in their everyday life (most of them walk for at least 30 minutes during most days of the week, which coincides to the WHO recommendations for participation in moderate physical activity), they seem to fall short in terms of systematic and intensive physical activity, mainly because of lack of time in the day and lack of interest or motivation.

Policy and practice regarding green infrastructure in Athens and sports/physical activity/ active mobility: The missing link and the structural management issues in the way.

The proportion of available urban green spaces in relation to the population of Athens is particularly low, in comparison both to other European cities and to the Greek planning standards and the targets of the Athens Master Plan. There is also a clear distinction between metropolitan green infrastructure that has historically enjoyed the interest and care of the competent agencies, and local green infrastructure (at district or neighbourhood level) that has resulted from local municipal plans. The policy in place for the design of green spaces in Athens focuses mainly on their bioclimatic design and the safeguarding of their green character, as well as the prevention and discouragement of delinquent behaviours. The local green spaces in Athens face a number of serious challenges, which have concentrated the attention and efforts by the competent municipal agencies:
• Although all of the existing local green spaces have been designated as such, only a few are fully under municipal ownership through the process of compulsory purchase, and face the danger of losing their designation.
• The illegal occupation of parts of public open spaces by commercial uses is unfortunately a common practice.
• The destruction and vandalism of infrastructure in open spaces is also an issue.

The focus of policy and practice related to open spaces and green infrastructure in Athens, is therefore placed on an effort to maintain the existing spaces and guarantee their green character and function.

Although most green spaces in Athens include municipal sports facilities, i.e. basketball courts, volleyball courts etc., there is no explicit policy focusing on the promotion of health and physical activity in these spaces as a whole or in the framework of routes connecting green spaces of Athens. There is also lack of information reaching the city residents on opportunities available for physical activity and active recreation, using the existing infrastructure, and ways to combine different activities in order to maximize health benefits in relation to the residents' profile and needs. This is probably due to a longstanding and structural problem regarding the management of public open spaces and green infrastructure, not limited to Athens but also observed in all major Greek cities. The management of the public open spaces in Athens is not the responsibility of one administrative body of the municipality, but seven different directorates of the City of Athens, each being responsible for a different aspect of management, i.e. planning and designation, design and maintenance of public space furniture, vegetation, construction works, cleaning, commercial uses, and sports facilities. This complex management structure naturally

results in lack of coordination and most importantly in failure to promote an overall integrated policy regarding the promotion of health and physical activity in open spaces, and to create routes connecting different open spaces. Hopefully, the newly established Healthy Cities Office of the City of Athens will manage to coordinate activities of different municipal bodies and introduce integrated policies towards the promotion of health and health-related activities in urban open spaces.

Furthermore, cycling is one of the least widespread physical activities in Athens, in contrast to other smaller Greek cities where it is quite popular. Athenians don't cycle to work or to shopping. The reasons behind this negative trend are mainly related to the lack of appropriate infrastructure (cycling lanes) due to the historical focus of the Athens transport planning policy towards car use, and the absence of sustainable mobility interventions.

Fortunately, recently there has been a turn in policy towards introducing "green corridors" in parts of Athens. The green corridors, i.e. green pedestrian and cycling routes that connect open and green spaces between them and with places of interest as well as public transport modes, aim at encouraging active travel and offering spaces and routes for recreation and exercise. An existing urban feature that supports the design and creation of green corridors in Athens has resulted from the widespread planning practice of creating tree-rows on both sides of the streets.

There also seems to be a turn in the municipality's policy related to sports, shifting from a model based on the sports clubs using the available infrastructure and providing opportunities for engaging to sports, to a model of increased accessibility, directly reaching the city residents at neighbourhood or district level and providing information and opportunities for making use of the available facilities.

Another relatively recent policy development in favour of active mobility in Athens is the "Athens Metropolitan Cycling Network", that has been included in the revised Athens Master Plan (2014). The proposed cycling network of 226 km aims at connecting residential areas to green spaces and sports facilities, as well as public transport modes, schools, shopping centres, and other places of interest, and aims at radically changing the transport model in Athens in the direction of sustainable mobility. Until now, only a very small part of this ambitious project has been implemented, due to the scarce funding resources available.

In conclusion, the policy and practice in Athens related to the use of green infrastructure for promoting public health through sports, active recreation and active mobility, is characterized by a missing link: an integrated policy that promotes the use of existing facilities and future interventions towards providing a wide range of options for physical activity, active recreation and active mobility. Although new plans and policies regarding active mobility and the creation of green corridors have been introduced in the recent years, their implementation is still lagging behind, due to obstacles related to limited available funding in the current harsh economic environment, and to the complex administrative structure that limits the coordination and management capacity needed. This integrated policy should include existing bottom-up initiatives (citizens' movements, local groups and associations) that link the use of public open spaces and the city's green infrastructure with the promotion of physical exercise and active recreation activities.

Conclusion

Taking the above issues into account, the need for formulating a policy on public health that will on the one hand inform the Greek population about the dangerous consequences of lack of physical exercise and on the other hand encourage the systematic participation in some form of physical activity during free time, is both obvious and urgent. In this direction, and taking into consideration the various consequences of the economic crisis still affecting a great proportion of the Greek population, it is necessary to improve the existing infrastructure in order to encourage and support such a systematic engagement in physical activity and active recreation in a way that it is accessible and affordable for all age groups and socioeconomic strata.

In metropolitan centres like Athens, this infrastructure can only be identified with the city's green infrastructure and active mobility networks. The role of the city's green spaces, whether of metropolitan or local character, as well as the planned networks of "green corridors" and cycling ways, as places offering an accessible and affordable alternative for engaging in systematic physical activity and active recreation, has to be highlighted in urban policy and supported with integrated interventions as well as information and awareness raising activities.

This turn towards the better use of the existing and the necessary interventions for creating new green infrastructure that will encourage systematic physical activity and active recreation, requires, in turn, changes in both the planning policy orientation and the management structure and culture. In terms of the planning policy, the focus needs to be placed in integrated interventions that also explicitly include this new role of the green infrastructure, besides its aesthetic, environmental and social function. With respect to the management of the city's green infrastructure, there is a need for abandoning the current management model of divided responsibilities amongst numerous municipal departments, and adopting a model that will concentrate responsibilities for promoting policies and interventions concerning the city's green infrastructure in a single management body. The establishment of the Healthy Cities Office in the City of Athens is definitely a step towards the right direction, however whether it will manage to fulfil its role, remains to be seen in practice.

Finally, this effort should be inclusive and based on cooperation, involving existing bottom-up movements and initiatives, and incorporating information and awareness raising activities, as well as an educational component that will aim at promoting and fostering health-related attitudes especially with regard to the use of the available green infrastructure.

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